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Monitoring Soil Bacteria with Community-Level Physiological Profiles Using Biolog™ ECO-Plates in the Republic of Tatarstan (Russia)

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Abstract

© Published under licence by IOP Publishing Ltd. Conservation of soil fertility is one of the most important tasks of the present time. As microorganisms are among the key factors in forming soil fertility, monitoring their state in natural and anthropogenically changed soils is an important component of compulsory environmental monitoring. Modern methods make it possible to evaluate the diversity and the functions of soil microorganisms, however, unfortunately, not all the soils are analyzed with their help up to the present moment. The present investigation is aimed to evaluate the functional diversity of five natural soil samples in the Republic of Tatarstan (belonging to sod-podzol, sod-carbonate, alluvial, and gray types) using the method of Biolog EcoPlate according to the index of average well color development, alpha-biodiversiry Shannon index (H), amount of substrates consumed ®, and strategy of consumption of various carbon substrate groups. It was shown that the highest AWCD index was found in sample No 3 - alluvial soil type (3.159±0.460), the lowest one - in sample No 5 - gray soil type (0.572±0.230). Correlation of biological activity of microorganisms with organic matter content in soil was shown.

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